AN AUTOMATED FADING PROCEDURE TO ALTER SEXUAL RESPONSIVENESS IN PEDOPHILES

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ABSTRACT: An automated stimulus fading procedure was used to strengthen sexual responsiveness to adult stimuli in two pedophiles. The degree of responsiveness was indicated by changes in the penile response. Slides of children and adults were superimposed. When subjects produced an erection above a designated criterion, one slide faded out and the other faded in; if responding then fell below this criterion, the fading process reversed. When a slide of a child was faded into an adult, subjects produced a high percentage of beyond-criterion responding. In test sessions where slides of adults and children were presented alone, response to adults was lower. When a slide of an adult was faded into a child and a covert self-instruction procedure was initiated to decrease response to the child, both subjects in test sessions produced high response to adult slides and decreased responding to slides of a child.

The necessity of direct behavioral intervention for the alteration of dysfunctional and maladaptive sexual behavior, rather than more traditional psychotherapeutic approaches, has been increasingly recognized in recent years. The use of behavioral techniques to alter sexual response may be seen in clinics for the treatment of sexual dysfunction (Hartman & Fithian, 1972; Masters & Johnson, 1970), in the client's own home (LoPiccolo & Lobitz, 1972; Marquis, 1970; Serber, 1974), as well as in the laboratory (Barlow & Agras, 1973; Laws & Pawlowski, 1973; McCrady, 1973). One of the more novel approaches was that reported by Barlow and Agras (1973) where a stimulus fading technique was used to increase heterosexual responsiveness in homosexuals. Using slides of nude females superimposed on slides of nude males, the male slide was faded out and the female faded in each time the subject met a criterion of penile response.

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Although homosexual arousal remained high throughout, these investigators reported about a 25% to 30% increase in heterosexual arousal in postfading generalization sessions.

Aversive conditioning has long been a favored behavioral treatment used to alter sexual orientation (see, for example, Marks & Gelder, 1967). The deliberate application of painful stimulation to clients raises serious ethical problems (Rachman & Teasdale, 1969), and alternatives to aversive conditioning should be actively sought. The nonaversive stimulus fading procedure reported by Barlow and Agras (1973) represents a significant step in this direction.

This paper describes a pilot study that also used a nonaversive fading technique. Although the present technique bears some similarity to that of Barlow and Agras (1973), it differs considerably in terms of goals and procedures. First, the approach reported here attempted to alter age interest within a sexual orientation, rather than to alter sexual orientation itself. Second, in the present technique (a) a continuous session rather than a discrete trial procedure was used and (b) the fading process was automatically controlled dependent upon changes in the subjects' sexual response, that is, above-criterion response produced fading in one direction and below-criterion response reversed the fading.

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METHOD

Subjects

Subjects were selected for the investigation on the basis of three criteria: (a) reported sexual disinterest in adults and/or (b) reported sexual dysfunction with adults, and (c) current involvement in scheduled social interactions with adults as part of their therapeutic program at the hospital.

Subject 1 (S1) was a 44-year-old male confined for the offense of female pedophilia. He had a continuous history of this behavior for the preceding 28 years. He stated a marked preference for girls 8 to 10 years old with long blonde hair and reported that his sexual fantasies were almost exclusively devoted to these persons. His actual sexual behavior with children consisted primarily of kissing, fondling, and cunnilingus. He had been married for the past 21 years. He reported difficulty in sexual relations with his wife, to the extent that he frequently had to use sexual fantasies of children in order to accomplish coition. When he presented himself for treatment he stated that he and his wife were devoted to one another and that he wanted to save the marriage. He expressed fear that "I might be locked up for the rest of my life if I don't do something about this attraction to children."

Subject 3 (S3) was a 22-year-old male confined for the offense of male pedophilia. He had an 11-year history of homosexual behavior with boys 12 to 13 years old, usually in the form of fondling and mutual fellatio. When he presented himself for treatment, he stated that he had had limited sexual experience with adults and that it had been largely disappointing and unsuccessful. He stated that he definitely desired a homosexual orientation but wished to be more responsive to adults.

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Apparatus

Apparatus for the procedure consisted of two Kodak carousel projectors, a Barlow-type penile transducer (Barlow, Becker, Leitenberg, & Agras, 1970), a specially designed criterion response sensor, a stepping motor that controlled lamp illumination in the projectors, a Beckman RM Dynograph, a counter that accumulated all time above criterion in seconds, and various electronic components that controlled the procedure.

Operation

Changes in the penile response were recorded on a polygraph and were simultaneously displayed on a relay meter in the criterion response sensor. The relay points in the meter were set at the desired criterion. When a criterion erection was emitted, the sensor operated the stepping motor controlling lamp illumination. If the subject continued to maintain an above-criterion erection, the stepper continued to operate, dimming out the lamp in Projector 1 and brightening the lamp in Projector 2. If the subject fell below criterion, the fading reversed, that is, Projector 2 dimmed out and Projector 1 brightened up again. The fading then was continuous; the direction of the fade was determined by the level of the subject's arousal.

Experimental Room

A quiet, secluded room in the hospital was divided in two; half contained the programming equipment, and half was the subject room. The projectors stood on a wall shelf in the equipment room and shone through a glass window into the darkened subject room. The subject sat in a comfortable reclining chair that faced a movie screen hung on the wall. Next to him was a small table on which a speaker produced white masking noise.

Stimuli

Subjects were asked to examine a collection of slides of nude adults and children of both sexes. They were asked to pick as many slides as possible of children whom they found sexually attractive, and as many as possible of adults who were attractive, or at least not unattractive. These slides formed the basic pool of stimuli used in the study.

Data

There were three types of data: penile circumference changes, percent of time above criterion, and subjective reports of the subjects.

Penile circumference changes. Penile changes were recorded by Barlow-type gauge (Barlow et al., 1970) and a Beckman polygraph. Response changes were not the basic data of the investigation but were recorded in order to (a) have a permanent record of response changes with all forward and backward steps indicated and (b) have a check on the accuracy of the criterion sensor. The subject put the transducer on and reported when his penis was flaccid. A predetermined zero point was then set on the polygraph. He then stimulated himself to full erection with the gauge on. When he reported full erection, a predetermined maximum point was then set on the

polygraph. The criterion response sensor was adjusted to track with the polygraph pen; for example, 70% on the meter equaled 70% elevation on the polygraph record.

Time beyond criterion. The basic data of the study are the percentage of the session time that the subject's response was above criterion. This was obtained by dividing the number of seconds accumulated on the counter by the total seconds of session time.

Subjective reports. Both subjects were extensively debriefed following each day's session as to what had occurred, what fantasies were used, how they felt that day, and so forth. Subsequently each subject prepared a written account in response to two questions: (a) What did you do in each of the fading procedures, and how did you feel about it? and (b) Have you noticed any changes in your attitudes toward adults, or any changes in physical attraction?

Procedure

Before any training sessions were begun, the entire procedure was explained to the subjects. We told them, considering their extensive sexual histories, that we did not realistically expect the arousal value of children to change very much, if at all. What we hoped to do was to use that learned arousal to train a different kind of behavior, responsiveness to adults, an alternative that could be equally reinforcing not to mention legal.

When the fading procedure began, one slide was in full illumination and the other superimposed slide so dim that the image was invisible. If the subject emitted the criterion response, the stepping motor controlling the projector lamps began operating 10 seconds later. As long as the response remained above criterion, the stepping motor operated at a preset interval until 16 equal steps were completed, resulting in the initially bright slide being faded out and the initially dim slide brought to full illumination.

Baseline. Each subject was asked to pick the most arousing slide of a child and the most attractive (or least unattractive) slide of an adult for purposes of baseline assessment. Each slide was then shown to the subject for 30-minute sessions on 2 consecutive days while penile response was monitored and time above criterion recorded. The subjects were instructed to imagine themselves in a sexual situation with the person depicted in the slide.

Fading: child to adult. These 30-minute sessions began with the child slide fully illuminated and the adult invisible. The subjects were instructed to fantasize to the slide of the child, then, when fading reached the point where the sexual characteristics of the adult were visible, to switch the fantasy to adults. We did not expect this to be an easy task for the subjects so the reversing feature was programmed. We reasoned that, if the subject fell below criterion and the adult faded back to the child, this would enable him to recapture his erection and start the fading back to the adult. In these first fading sessions the same two slides from the baseline period were presented at a 10-second fading interval.

A second series of child to adult fading sessions was also conducted. These were identical to the first series except that each subject's preferred slides were placed in a random order of presentation so that he was unable to predict which child would be paired with which adult on any day. This method of slide presentation was maintained throughout the remainder of the study. The interval between fading steps was also changed from 10 seconds to 5 seconds.

In both child to adult fading series the criterion for fading was set at 70% of maximum erection.

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Fading: adult to child. These sessions began with the adult slide fully illuminated and the child slide invisible. The subjects were instructed to imagine themselves in a sexual situation with the adult and attempt to become aroused. In addition, they were given two instructions for the alteration of fantasy. First, if they became aroused to the adult and the child began to fade in they were to allow the image to become visible. When it was clearly in view, they were instructed to covertly use self-instructions such as: "Why am I attracted to this kid? Kids aren't as much fun as adults, and they always get me into trouble. I don't want to do this anymore, and I don't want to be excited by kids."

They were told that use of these covert self-instructions would interrupt any fantasies associated with children and assist them in losing their erections. Second, when the adult faded back to clear visibility, they were to again try to become sexually aroused. When they began to feel aroused they were to use self-instructions such as: "Now this is much better. She [or he] is much more attractive than that kid. This is what I ought to be doing."

The covert manipulation of these two sequences is similar to the use of thought stopping (Lazarus, 1971) followed by the introduction of competing thoughts that focus on the desired goal of the treatment. These two sequences were to be repeated as often as the subject could manage within the session.

There were three series of adult to child fading sessions. The sessions were identical except that the criterion was successively raised from 70% to 80% for S1 and from 70% to 80% to 90% for S3 in an effort to strengthen responsiveness to the adult. In the first series of adult to child fading the session time was 30 minutes for S1 and 15 minutes for S3; subsequently all session times were 15 minutes in duration.

Responsiveness tests (T1 through T5). Following all fading series, tests were conducted that were identical to the baseline period. These sessions were initially 30 minutes in length and were conducted on 2 consecutive days. Beginning with the third test (T3), these test sessions were shortened to 15 minutes and were conducted consecutively on the same day. Stimuli for the responsiveness tests were whichever slides appeared in the random order for that day, with the exception of the first test (T1) where the same slides from the first child to adult fading series were used.

RESULTS

Child to Adult Fading

The data for all phases of child to adult fading are shown in Figure 1. The data points indicate the total session time that the penile response exceeded the criterion, and the abcissas show the session days with vertical lines separating the various phases of the investigation. The first phase was a baseline period (B) followed by the first fading series where the same two slides were shown exclusively, and the first test (T1). The second phase was the second fading series where various slides were presented in random order, followed by the second test (T2). The criterion for fading was 70% in both series. The fading step interval was decreased to 5 seconds on the 1st day of the second series for S1 and the 2nd day of that series for S3.

Subject 1. Baseline assessment for S1 showed that he was highly

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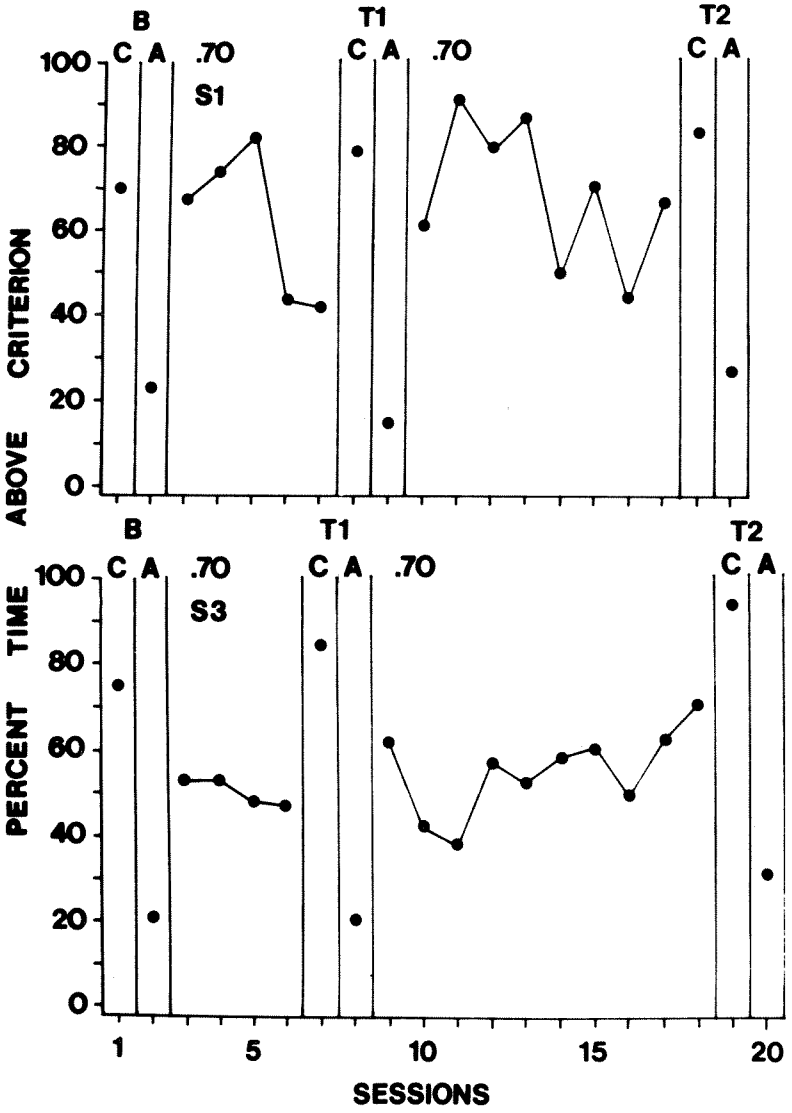

Figure 1. Child to adult fading. Data points represent the percentage of session time that penile response was above indicated criterion. In panels designated B, T1, and T2, slides of children (C) and adults (A) were presented alone.

responsive to the child slide presented alone (70%) and showed very little response to the adult (23%). In the first fading series he averaged 62% time above criterion. Initially he was able to stay aroused and keep the adult faded in for long periods, but this responsiveness diminished toward the end of the series. T1 showed that independent responsiveness to adults was even lower than in the baseline period.

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S1 complained of satiating to the slides, so the randomized order was devised for the second fading series. Presentation of varied stimuli resulted in a higher average percentage of time above criterion (68%), but responsiveness was again variable toward the end of the series. T2 showed a continuing low independent responsiveness to adults.

Subject 3. Baseline assessment for S3 also showed a high independent responsiveness to children (75%) and a low response to adults (21%). S3 averaged 50% time above criterion in the first fading series, indicating that the child image was present as often as the adult. T1 showed that independent response to adults was the same (20%) as that during baseline.

S3 also complained of satiation, so a randomized order of slide presentation was constructed for him as well. Presentation of varied stimuli resulted in a gradual increase in the percentage of time beyond criterion after an initial drop, averaging 55% for the second series. T2 showed about a 10% increase in response to adults.

Figure 2 shows two 12-minute samples of polygraph tracings for the two subjects that are representative of their response patterns in the

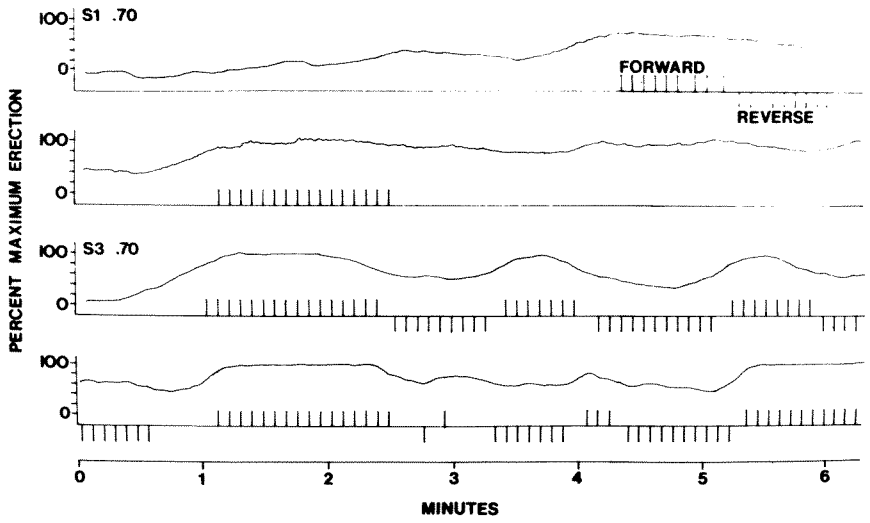

Figure 2. Penile response record for 12 minutes of child to adult fading session for both subjects. Ordinates indicate the percentage of maximum erection. Upward pointing events indicate forward fading steps and downward points reverse fading steps.

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second child to adult fading series. In the top two panels we see that S1 took almost 4 minutes to exceed the criterion the first time, faded the adult into clear visibility, then gradually lost the erection to about 40% of maximum. Between the 6th and 7th minute he recaptured the erection, completed the full 16 fading steps, and remained above criterion for the rest of the period although the small rapid traverses of the pen indicate struggling on his part. This eventual performance of a full fade and holding the response above criterion for long periods was typical of S1's behavior in this series.

In the lower two panels we see that S3 achieved full erection in slightly over the 1st minute, fading the adult in completely, but then immediately lost it and faded the child back in, regained it, lost and regained it again in somewhat over 5 minutes. By the 7th minute he was rapidly producing full erection and holding it at 100% for the full 16 steps, fading in the adult. He remained highly responsive and by the 11th minute produced another full erection and faded the adult in. This up-down pattern of response was typical of S3's behavior in this series.

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Adult to Child Fading

Figure 3 shows the data for all phases of adult to child fading sessions. These fading series were the same as the preceding ones except that the criterion for fading was raised to 80% in the second series for S1, and to 80% in the second series and to 90% in the third for S3. The percentage of session time above criterion would be expected to fall during these sessions due to the subjects' use of the covert self-instructions; subjects were to meet the criterion, fade in the child, and lose the erection as quickly as possible using the covert procedure.

Subject 1. The upper panel of Figure 3 shows the data for adult to child fading for S1. In this reversed fading procedure S1 proved able to produce criterion erections to the adult stimulus and lose the erection with the child faded in, and then repeat this performance. With the fading criterion at 70%, he averaged 40% time above criterion. The test (T3) for the first adult to child fading series showed him to be highly responsive to the adult presented alone (75%) and for the first time showed diminished responsiveness to the child (45%). In the second fading series with the criterion at 80%, more variability developed, evidenced by his inability to repeatedly meet the criterion on the 2nd and 4th days. The average percentage of time above criterion for this series was 24%. The test (T4) for the second fading series showed a further diminished response to the child

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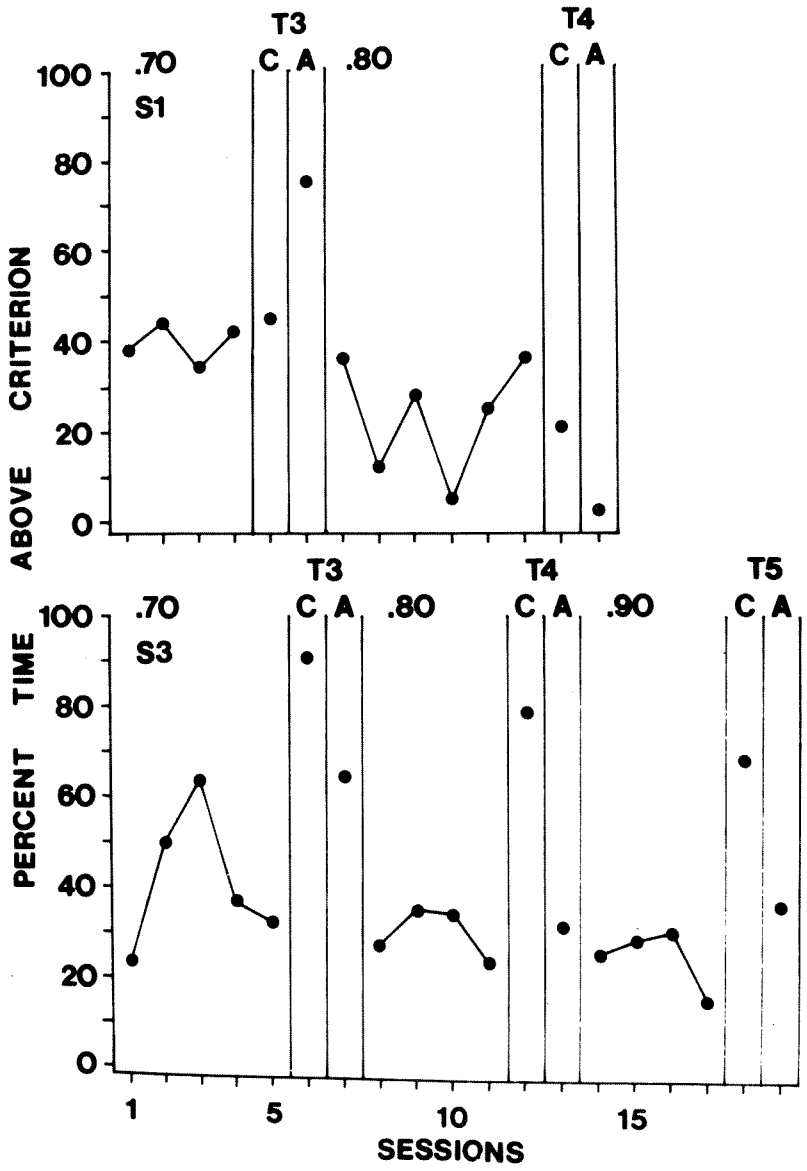

Figure 3. Adult to child fading. Large panels are fading series with differing criteria for fading indicated. In panels designated T3, T4, and T5, slides of children (C) and adults (A) were presented alone.

(21%), but also quite low response to the adult (3%) due to his inability to produce more than one criterion erection.

Subject 3. The lower panel of Figure 3 shows the data for S3 for adult to child fading. S3 also proved able to produce criterion erections in

this reversed procedure. With the fading criterion at 70%, he averaged 41% time above criterion. However, his performance was marked by variability on the 2nd and 3rd days when he had difficulty in losing the erection once the child was faded in. He was able to master this by the 4th day, and thereafter his performance was stable. The test (T3) for this series showed continued high responsiveness to the child (91%) but also high responsiveness to the adult (65%). In the second fading series the criterion was increased to 80%, and the percentage time above criterion fell to an average of 31%. The test for the second fading series (T4) showed continued high responsiveness to the child (79%) and moderate response to the adult (32%). The final fading series resulted in an average percentage time above criterion of 25%. The final test (T5) showed S3 to be still highly responsive to the child (69%), and the responsiveness to adults remained stable in the moderate range (37%).

Figure 4 shows two 12-minute samples of polygraph tracings from the adult to child fading series with the criterion at 70%. The top two panels show the first 12 minutes of S1's behavior as he gradually produced the response to the adult, faded the child in, lost the erection, faded the adult back in, and repeated the performance. Responding characteristic of S1 may be seen at the points designated "S" (covert self-instruction). At the 10th forward step he had the child faded in, began the covert self-instruction, which produced a precipitate drop of about 20% in the response each time.

S3's performance was quite dissimilar. He was also slow to produce

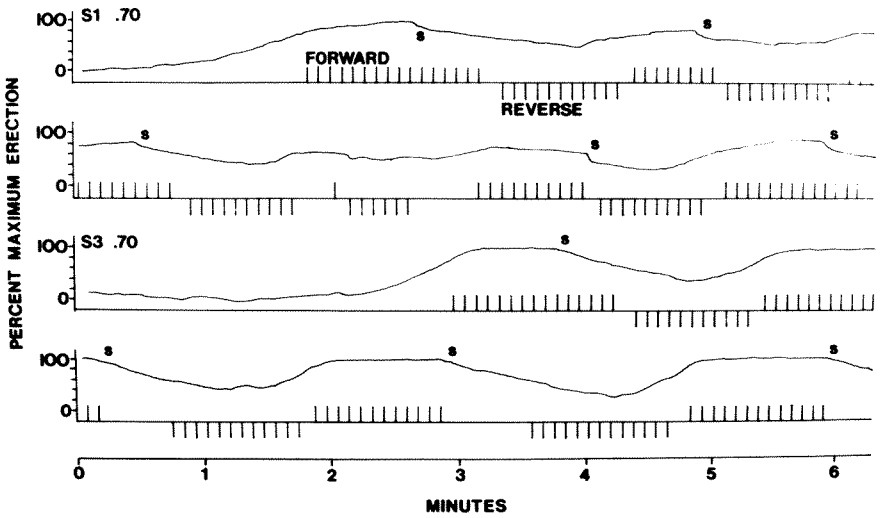

Figure 4. Penile response records for 12 minutes of adult to child fading for both subjects. Points designated S indicate subject's use of covert self-instruction.

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an erection to the adult, but as in the child to adult fading series, he was also slower in losing it once the child was faded in (note response at "S" points). His performance in adult to child fading was characterized by much slower overall response than he had shown previously (see Figure 2).

DISCUSSION

This pilot investigation failed to demonstrate the effectiveness of an automated stimulus fading technique when a slide of a child was faded into a slide of an adult. Following child to adult fading, we were unable to show an independent response to adults. After two series of child to adult fading, response to adults presented alone was either lower or insubstantially higher than that shown in the baseline condition. The reason for this may lie in our use of the reverse fading feature. We did not expect the subjects, at least initially, to be able to maintain above-criterion response during fading when the non-preferred stimulus, the adult, was present. The reversing feature was included so that they would be able to regenerate erection to the child stimulus and start fading forward again. We expected that this would permit the frequent pairing in time of high arousal with adult stimuli, eventually enabling the subjects to produce erection in the presence of the adult stimulus alone. This was apparently not a tenable assumption, at least within the limited context of this investigation. It may be that the reverse fading had the effect of continuously informing the subject that he was failing to maintain his erection to the adult. This experience of continuous failure in fading may possibly account for the subjects' inability to produce the response to the adult alone. In support of this interpretation, S1 reported that child to adult fading was actually destructive of his efforts to alter his responsiveness:

When the picture fades from a little girl to an adult woman, I am under pressure to find something sexually exciting about her before the fading reverses. . . . I believe this is reinforcing my feeling that adult women are not really rewarding and fulfilling sex partners, and further reinforces this by the picture fading back to a little girl that I see as . . . relaxed, rewarding, and fully enjoyable.

It is worth noting that the Barlow and Agras (1973) fading technique had a limit to which the subject could fade backward and did not permit this experience of failure. In their procedure, if the subject did not meet the criteria for forward fading, he was presented with 18 consecutive trials in an attempt to succeed before there was

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any change in the criterion for fading. Following fading, they were able to demonstrate increased responsiveness to a previously non-preferred stimulus presented alone.

However, when the present fading procedure was reversed (adult to child) and covert self-instructions added, both subjects were able to produce criterion erections to the adult in order to fade in the child, use self-instructions to fade the child out, then reproduce the response to the adult. McCrady (1973) also reported successfully altering responsiveness in a homosexual by fading an adult female into an adult male. He used a procedure similar to that of Barlow and Agras (1973) but did not require the emission of a criterion erection for fading to begin. Fading proceeded independent of the penile response, and the fading increment at which maximum erection occurred on that trial was recorded. McCrady's subject eventually produced erection to the female slide alone, and the responsiveness was shown to generalize to slides not used in treatment.

It must be emphasized that the adult to child fading procedure produced marked change in responsiveness *only* following the 70% criterion series. At T3, S1 showed 75% time above criterion, an increase of 52% above baseline level. When the criterion was raised to 80% for S1 he was able to produce only a single criterion erection, resulting in an 18% decrease below baseline level. At T3, S3 showed 65% time above criterion, an increase of 44% above baseline level. S3's response to adults following the 80% and 90% criterion series was not substantially different from that shown in the pretreatment baseline. No firm conclusions may be drawn from these results at the present time. The subjects had only a minimum of four and a maximum of six fading sessions prior to the responsiveness tests. Seventy percent is an easier criterion to meet than 80% or 90%, and the data reflect this. More extensive training at the higher criteria might well produce very different results.

The percentage of time above criterion is a somewhat deceptive measure in that it is only informative about arousal beyond an already high level. Relatively high but subcriterion arousal could be occurring throughout a test session and not be recorded. If we examine the average percentage of erection in the adult test sessions, we get a clearer picture of what happened in the tests following both fading procedures. The child to adult procedure did not produce overall heightened response to adults according to this measure. S1 showed an average percentage of erection to adults of 55% during baseline, 55% during T1, and 54% during T2. Similarly, S3 showed 46% during baseline, 43% during T1, and 47% during T2. When we examine the average percentage of erection in the adult tests following the adult to child fading, the picture is considerably

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different, but only for S3. S1 showed an average percentage of erection of 78% during T3 and 29% during T4, which was consistent with the time above criterion measure. S3, on the other hand, showed an average percentage of erection of 72% during T3, 60% during T4, and 85% during T5. The time above criterion measure was reasonably consistent with the average percentage of erection at T3, but proved to be an underestimate of S3's general level of arousal at T4 and particularly at T5.

There was little change in the subjects' response to children presented alone following the child to adult fading sessions. This is not unexpected since the known responsiveness to children was used to trigger the fading. In addition, they were given no instructions to suppress their response to children other than to attempt to switch their fantasies to adults when the adult slide became visible.

Following the adult to child fading series, a decline in responsiveness to children in the test sessions was evident in both subjects although it was less pronounced in S3. The data in Figure 3 and the response records in Figure 4 clearly show that the subjects were altering their response to children during the fading sessions by the use of the covert self-instruction procedure. This albeit brief training apparently contributed to the lowered responsiveness to children presented alone in the test sessions. Verbal reports by the subjects suggest that this indeed was the case. S1 reported: "The need to lose my erection when the little girl comes on makes it impossible to think of her in any erotic way. . . . My thinking of the little girl as *not* a good sex partner causes me to realize her negative qualities and see her as just an immature girl." S3 reported: "I think your machine has done something to my head. I'm having more and more trouble getting it on with the boy."

The question remains as to how the subjects were able to produce criterion erections to adults in the adult to child series. Several interpretations can be offered, none of which is entirely adequate alone, but which in combination offer the best overall explanation. First, neither subject was totally unresponsive to adults as the average percentage of erections from baseline indicates (55% for S1, 46% for S3). Each had had sexual experience with adults, although S1 was dysfunctional due to his obsessive fantasies of children, and S3's adult homosexual contacts had been limited.

Second, there may have been a practice effect from the earlier child to adult fading sessions. The practice in pairing above-criterion arousal with adult fantasy may have facilitated the ability to produce erection in the adult to child sessions. The data from T1 and T2 argue strongly against this interpretation, however.

The third, and most persuasive explanation, is that the use of

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covert self-instructions enabled the subjects to interrupt sexual thought processes associated with children. The attendant loss of erection assisted them in separating sexual arousal from these stimuli. The resulting fading in of the adult and switching to positive thoughts of adults were experienced as a reinforcing and relaxing state that facilitated sexual responding to adult stimuli. Reports from the subjects support this interpretation. S1 stated: "I am not under pressure to achieve an erection, and I am able to look at the woman . . . and let my erection happen more naturally. The alternating off-on of the woman with corresponding off-on thinking sexually seems to build my erotic feeling for the woman." S3 stated: "I was told to think negative thoughts toward the boy after he faded in: 'This is why I'm here. . . . I want out of this bag, not deeper into it.' It has become an easier thought to the adult and an automatic negative thought to the kid."

Fourth, and finally, both subjects reported increased confidence in themselves and in their ability to socially interact with adults outside of the investigation. S1 entered a family treatment program at the hospital where he was required to deal realistically with his marital difficulties as well as interact on an extensive basis with female program personnel. S3 joined the homosexual club at the hospital. This meant that he was involved in therapeutic activities such as gay social skills training and gay consciousness raising with adult members of the homosexual community, and was in addition placed in contact with gay community service centers that could provide posthospitalization job finding, housing, counseling, religious, and social opportunities.

In summary, it is our belief that this pilot study of a new method produced several promising if tentative results. The child to adult fading did not "work" in the sense that we had intended. This could be due to the reverse fading feature discussed above, or it could be due to the small number of fading sessions. Further work should include much more extensive training before any responsiveness tests are attempted. Should extensive training not result in increased responsiveness in test sessions, we might fairly conclude that the reversing feature was indeed providing a built-in failure experience. Adult to child fading produced increased independent response to adults but only following the 70% criterion series. Again, more extensive training at the higher criteria is indicated. More importantly, however, the present study failed to demonstrate which procedure, the fading or the covert self-instructions, was responsible for the changes observed. Further work must not only increase the number of training sessions but also compare fading with and without covert self-instructions to clarify this confounding. Finally, this

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method must be tested with a more heterogeneous subject population. We worked with only two pedophiles, one heterosexual and one homosexual, both of whom had had sexual experience with adults. More data are required on subjects of this type, but especially on pedophiles with no adult sexual experience, before we can begin to make any conclusions regarding the efficacy of the technique.

The findings of this investigation add support to a growing body of evidence that positive rather than the typical aversive conditioning procedures can be used for the alteration of maladaptive sexual behavior. In a time of increasing suspicion about the means and ends of behavior modification, such procedures offer an inviting alternative deserving thorough exploration.

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